PRELIMINARY ESTIMATE OF BSAF FOR THE TIDAL DELAWARE RIVER

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I. ADL PCB and TOC Data for Delaware Estuary Non-Channel Sediments Between Philly and C&D Canal

Sample ID	Reach	Description	DRBC Zone	PCB (ug PCB/kg sed, ppb)	TOC (wt %)	Fraction O.C. (kg O.C./kg sed)	O.C. Normalized PCB Conc. (ug PCB/kg O.C.)
16-Sed	A	North Philly to Camden		98	3.29	0.0329	2978.72
15-Sed	A	North Philly to Camden		199	4.89	0.0489	4069.53
14-Sed	A	North Philly to Camden		85	1.07	0.0107	7943.93
13-Sed	A	North Philly to Camden		158	4.25	0.0425	3717.65
12-Sed	B	Camden to Marcus Hook		76	2.19	0.0219	3470.32
11-Sed	B	Camden to Marcus Hook		167	3.33	0.0333	5015.02
10-Sed	B	Camden to Marcus Hook		277	3.62	0.0362	7651.93
9-Sed	B	Camden to Marcus Hook		192	2.15	0.0215	8930.23
8-Sed	C	Marcus Hook to C&D Canal		22	1.37	0.0137	1605.84
7-Sed	C	Marcus Hook to C&D Canal		144	1	0.01	14400.00
6-Sed	C	Marcus Hook to C&D Canal		60	2.13	0.0213	2816.90
5-Sed	C	Marcus Hook to C&D Canal		118	1.86	0.0186	6344.09

Summary Stats for O.C. Normalized PCB

Mean	5745.35
Median	4542.27
Standard Deviation	3565.85
Kurtosis	2.04
Skewness	1.34
Minimum	1605.84
Maximum	14400.00

II. Fish Tissue PCB and Percent Lipid Data for the Tidal Delaware River

Once the "Fish Tissue Data Summary Report" is completed, a median lipid normalized PCB concentration in fish from Zones 2 through 5 will be calculated. Until then, a range of lipid normalized PCB concentrations can be considered based upon the approximate range of observed PCB and percent lipid values in fish.

Approximate Range Observed in Muscle Tissue (ug PCB/kg fish, ppb)	Fish Tissue PCB Conc. (ug PCB/kg fish)	Percent Lipid in Muscle	Fraction Lipid (kg lipid/kg fish)	Lipid Normalized PCB Conc. (ug PCB/kg lipid)
100-1000	100	2	0.02	5000
	250	2	0.02	12500
	500	2	0.02	25000
	750	2	0.02	37500
	1000	2	0.02	50000
	100	3	0.03	3333
	250	3	0.03	8333
	500	3	0.03	16667
	750	3	0.03	25000
	1000	3	0.03	33333
	100	4	0.04	2500
	250	4	0.04	6250
	500	4	0.04	12500
	750	4	0.04	18750
	1000	4	0.04	25000
	100	5	0.05	2000
	250	5	0.05	5000
	500	5	0.05	10000
	750	5	0.05	15000
	1000	5	0.05	20000

III. BSAF Calculations

Assumed O.C. Normalized PCB Sediment Concentration (ug PCB/kg O.C.)	Fish Tissue PCB Conc. (ug PCB/kg fish)	Percent Lipid in Muscle	Fraction Lipid (kg lipid/kg fish)	Lipid Normalized PCB Conc. (ug PCB/kg lipid)	BSAF (kg sed O.C./kg fish lipid)
4542.27	100	2	0.02	5000	1.10
4542.27	250	2	0.02	12500	2.75
4542.27	500	2	0.02	25000	5.50
4542.27	750	2	0.02	37500	8.26
4542.27	1000	2	0.02	50000	11.01
4542.27	100	3	0.03	3333	0.73
4542.27	250	3	0.03	8333	1.83
4542.27	500	3	0.03	16667	3.67
4542.27	750	3	0.03	25000	5.50
4542.27	1000	3	0.03	33333	7.34
4542.27	100	4	0.04	2500	0.55
4542.27	250	4	0.04	6250	1.38
4542.27	500	4	0.04	12500	2.75
4542.27	750	4	0.04	18750	4.13
4542.27	1000	4	0.04	25000	5.50
4542.27	100	5	0.05	2000	0.44
4542.27	250	5	0.05	5000	1.10
4542.27	500	5	0.05	10000	2.20
4542.27	750	5	0.05	15000	3.30
4542.27	1000	5	0.05	20000	4.40

"Best" estimate of BSAF at this time is based on a tissue conc. between 250 ppb and 500 ppb and a lipid content between 3% and 4%. The range of possible BSAFs under these conditions spans from 1.38 to 3.67. This range will be narrowed following completion of the Fish Tissue Data Summary Report." Incidently, DE used a BSAF of 1.85 to derive its bioaccumulation-based sediment quality guideline for the protection of human health (Greene, 1997).

The BSAF for the tidal Delaware River can be further refined by weighting the sediment PCB and organic carbon concentration in the non-channel areas (ADL data) with the sediment PCB and organic carbon concentration in the main navigational channel (COE data).